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posited by the Joseph's Coat Springs and other geysers, and is also often found in little nodules in the cavities of this sinter. An analysis of the purified scorodite yielded Mr. Whitfield,—

$\text{Fe}_2\text{O}_3$	$\text{As}_2\text{O}_5$	$\text{H}_2\text{O}$
34.94	48.79	16.27

Analyses of the waters of these geysers show a small percentage of arsenious acid.—Reusch<sup>1</sup> has examined the crystallized *kaolin* from Denver, Colorado, to which Cross and Hillebrand first called attention.<sup>2</sup> He declares it to be triclinic and not orthorhombic as Hillebrand supposed.—A. Kenngott<sup>3</sup> describes two peculiar crystals of *gypsum* from Poland, Ohio, and calls attention to a new formula for *tantalite* from Dakota, based upon the analysis of Schaeffer,<sup>4</sup> published a few years ago.

#### BOTANY.<sup>5</sup>

**The Genus Geaster.**<sup>6</sup>—Dr. G. B. De Toni, of the Botanical Institute of the University of Padua, has lately made a careful revision of the genus Geaster. Accepting, with Fries, the definition of the genus as proposed by Micheli in 1729, after much reduction, he increases the number from fourteen, as enumerated by the illustrious Swedish savant in 1829, to forty-eight well-authenticated species. Making a careful study of the leading features of the species, he has been enabled to arrange them into seven quite distinct and fairly recognizable sections, as follows:

1. COLUMNATI.—*Inner peridium supported on several pedicels.*

This section includes the singular *G. coliformis* Dicks. with many mouths to the inner peridium, and *G. columnatus* Lev., from Chili, having but a single orifice.

2. FORNICATI.—*Outer peridium separating into two distinct strata, one obversely fornicate.*

This contains three species,—*G. fornicatus* Huds., and the little-known *G. radicans* B. & C., and *G. welwitschii* Mont. We may here remark that this fibrous lowest stratum clinging to the earth exists in *G. limbatus* Fr., and perhaps in several other Geasters.

3. CUPULATI.—*Outer peridium augmented by a membranaceous, often irregular cupule about the base of the inner peridium.*

This section contains only *G. triplex* Jungh. and the uncertain *G. duplicatus* Chev. We have observed this basal membrane in other species of Geaster; it occurs as a mere incidental breaking away of the lower portion of the inner fleshy stratum of the outer peridium. Specimens of *G. duplicatus* are to be found

<sup>1</sup> Neues Jahrb. f. Min., etc., 1887, ii., p. 70.    <sup>2</sup> Bull. U. S. G. S., No. 20.

<sup>3</sup> Ib., 1887, ii., p. 84.

<sup>4</sup> Amer. Jour. Sci., 1884, xxviii., p. 430.

<sup>5</sup> Edited by Prof. CHARLES E. BESSEY, Lincoln, Nebraska.

<sup>6</sup> "Revisio monographica generis Geasteris, Mich." Auctore Dr. G. B. De Toni. Revue Mycologique, No. 34, Avril, 1887.

without the basal cupule, though it is generally present in all fully-grown examples. This leads us to suggest that it might be well to distribute the species of sections 2 and 3 among those that follow.

4. STRIATI.—*Peristome sulcate-plicate or pectinate-striate.*

A well-marked section! It comprises ten species. The salient species are *G. bryantii* Berk., *G. umbilicatus* Fr., and *G. striatus* D. C.; the others cluster about them as more or less closely-related species. The five species, *G. striatus*, *elegans*, *striatulus*, *ambiguus*, *drummondii*, form an elegant group of remarkably near relatives.

5. FIMBRIATI.—*Peristome fimbriate-floccose or ciliolate, situated in a circular, distinctly radiate-fibrillose areola.*

This section comprises the largest number of species (twenty altogether). The well-known species are *G. minimus*, *limbatus*, *fimbriatus*, *mammosus*, *saccatus*. It contains a curious xylophilous group of four species, represented by the *G. mirabilis* Mont. The numerous species clustering about *G. fimbriatus* Fr. and *G. saccatus* Fr. are difficult of definition; these two are near enough related, the presence and absence of the circular areola being the only obvious mark.

6. PAPILLATI.—*Peristome papilliform, glabrous.*

This section contains two small species,—*G. floriformis* Vitt. and *G. pusillus* Fr.,—which may be identical.

7. EXAREOLATI.—*Peristome either dentate, always destitute of the circular areola, or irregularly or stellately deliscing.*

This section comprises nine species, including the well-known *G. rufescens* Pers. and *G. hygrometricus* Pers.

Besides the forty-eight species of these seven sections there are five additional species less known or imperfectly described, among them the singular *G. linkii* Spreng., which does not seem to have been found by any one except Link and Schweinitz. If there are specimens of it in Schweinitz's herbarium, they should be carefully described.

There is an interesting table of the geographical distribution of the species. The seventeen species in the United States might have been increased by the addition of *G. coliformis*, from the *Journal of Mycology*, vol. i. p. 7.

Two good plates figure several characteristic species and others not so well known.

From the Western plains we have lately received two species wholly unlike any examples in our possession, and which seem to us quite different from any of the species described in Dr. De Toni's monograph. We figure and characterize them as follows:

1. *Geaster campestris* Morg. (Fig. 1).—Outer peridium thick, multifid; the segments (eight to ten) reflexed, whitish below, rufescent within. Inner peridium globose, subpedicellate, verru-

cose, gray, or brownish, the mouth conic, sulcate-plicate, in a circular, marginate disk. Spores globose, verruculose, brown, .0055-.007 mm. in diameter.

Growing in clusters, at first half immersed in the soil, on the open prairie about Lincoln, Neb. Sent by Prof. Charles E. Bessey.

FIG. 1.

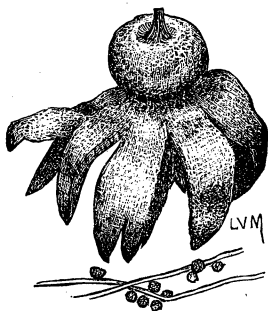
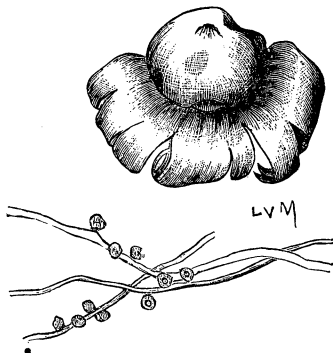


FIG. 2.



Inner peridium three-eighths to three-fourths of an inch in diameter, the expanded segments one to two inches. The outer peridium is concave or vaulted underneath, with the segments often inflexed at the tip, as in *G. bryantii* and *G. limbatus*; it also has the same fibrillose stratum beneath binding it to the soil; when this is cleared away it leaves a smooth, whitish outer surface. In most of the dried specimens the inner peridium is distinctly pedicellate. The peculiar feature of this species, however, is the minute, scaly or granulose warts which invest the surface of the inner peridium; there is no other species with a similar surface, unless it be the *G. granulose* Fuckel, which is described as "covered with a white granulose powder." Moreover, it has a filamentous peristome, and belongs among the *Fimbriati*, while our species belongs to the *Striati* of Dr. De Toni's arrangement.

2. *Geaster delicatus* Morg. (Fig. 2).—Outer peridium thin, multifid; the segments (six to ten) unequal, revolute, whitish below, alutaceous within. Inner peridium depressed-globose, sessile, puberulent, pallid; the mouth lacerate. Spores globose, verruculose, fuscous, .005-.006 mm. in diameter.

Growing on the prairie around Lincoln, Neb. Sent by Prof. Charles E. Bessey.

Inner peridium one-fourth to one-half of an inch in diameter, the expanded segments an inch or more. The segments, when fresh or wet, are strongly revolute, and become inflexed when dry, after the manner of *G. hygrometricus*; they are nearly papyraceous, the inner, fleshy stratum being remarkably thin; the color outside is whitish or glaucous, and the external surface is

very smooth. There is no determinate circular areola to the inner peridium and the mouth is stellately lacerate or sometimes a mere slit or puncture. The nearest relative would appear to be *G. bovista* Klotsch, from which it differs in several particulars; it belongs to the same section, the *Exareolati*, of Dr. De Toni's monograph.—A. P. Morgan, Preston, Ohio.

#### ENTOMOLOGY.<sup>1</sup>

Observations of Portchinski on Flies which, in their Larva Stage, cause Diseases among Men and Animals.—Baron Osten Sacken gives<sup>2</sup> an account of some publications of Mr. Portchinski, from which we extract the following, as of general interest:

For many years past Mr. Joseph Portchinski (at present secretary of the Entomological Society in St. Petersburg) has been devoting a great deal of time to the study of the life-habits of carnivorous and coprophagous larvæ of Muscidæ, and several valuable publications on that subject are due to his pen already. But as most of these publications are written in Russian, they have remained less known than they deserve. Several of them, however, have appeared in German in the *Horæ Soc. Ent. Ross.*, and two of these are on the subject indicated in the heading to this extract.

The principal result which science owes to these papers is the elucidation of the history of *Sarcophila wohlfahrti* as a dangerous but hitherto unrecognized enemy of men and animals, the European substitute of the celebrated *Lucilia macellaria* (syn. *L. hominivorax*) of America. In 1768, Dr. Johann August Wohlfahrt, physician in Halle, published a paper ("Observatio de Vermibus per Nares excretis") describing a case where peculiar worms in the nose of an old man produced intolerable headache, and almost drove him to madness. Wohlfahrt succeeded in breeding the fly of these larvæ, and gave a description, accompanied with figures sufficient for the recognition of the species. Numerous similar cases have been observed since, and either altogether misunderstood or else ascribed to different other species of common carnivorous flies,—species of *Sarcophaga*, *Lucilia*, *Calliphora*. To Mr. Portchinski belongs the merit of having pointed out that the great majority of the cases of the *Malum verminosum* observed on men and animals are produced by that particular species, described more than a century ago by Wohlfahrt, and so far overlooked since, owing probably to its close resemblance to other species, that it was described for the first time by Schiner in 1862 only, who had no idea of its

<sup>1</sup> This department is edited by Prof. J. H. COMSTOCK, Cornell University, Ithaca, N. Y., to whom communications, books for notice, etc., should be sent.

<sup>2</sup> Berliner Entomolog. Zeitschrift, Bd. xxxi. p. 17.